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GenCore version 5.1.6
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OM nucleic - nucleic search, using sw model

Run on: June 17, 2003, 18:49:41 ; Search time 290 Seconds
(without alignments)
8099.428 Million cell updates/sec

Title: US-09-807-933B-13

Perfect score: 1043

Sequence: 1 ggatctctggacaagatgaa.....cgcaagtaaacgagatgcc 1043

Scoring table: IDENTITY NUC

Gapop 10.0 , Gapext 1.0

Searched: 2185239 seqs, 112599159 residues

Total number of hits satisfying chosen parameters: 4370478

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%

Listing first 45 summaries

Database :

N_Geneseq_101002.*
1: /SIDS2/gcgdata/geneseq/geneseqn-emb1/NA1980.DAT.*
2: /SIDS2/gcgdata/geneseq/geneseqn-emb1/NA1981.DAT.*
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22: /SIDS2/gcgdata/geneseq/geneseqn-emb1/NA2001A.DAT.*
23: /SIDS2/gcgdata/geneseq/geneseqn-emb1/NA2001B.DAT.*
24: /SIDS2/gcgdata/geneseq/geneseqn-emb1/NA2002.DAT.*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	1043	100.0	1043	21	AAA62732
2	1043	100.0	1043	24	AAA43250
3	594.6	57.0	1017	21	AAA62726
4	594.6	57.0	1017	24	AAA43244
5	421.2	40.4	1101	21	AAA62727
6	421.2	40.4	1101	24	AAA43245
7	362.4	34.7	1083	21	AAA62728
8	362.4	34.7	1083	24	AAA43246
9	333.8	32.0	1041	21	AAA62731

10	333.8	32.0	1041	24	AA143249	Phycomyces nitens
11	288.4	27.7	1017	21	AAA62729	Endoglucanase nucl
12	288.4	27.7	1017	24	AA143247	Rhizopus arrhizus
13	286.4	27.5	1058	13	AAQ26405	Humicola insolens
14	286.4	27.5	1060	12	AAQ14856	Humicola insolens
15	286.4	27.5	1060	13	AAQ26380	Endoglucanase #1.
16	286.4	27.5	1060	13	AAQ25932	Cellulase containe
17	286.4	27.5	1060	13	AAQ29934	Endoglucanase gene
18	286.4	27.5	1060	13	AAQ30067	Sequence encoding
19	286.4	27.5	1060	14	AAQ41732	Dye transfer inhib
20	286.4	27.5	1060	14	AAQ49941	Endoglucanase enzy
21	286.4	27.5	1060	16	AAZ60178	H. insolens endogl
22	286.4	27.5	1060	17	AAT10182	Alkaline endogluc
23	286.4	27.5	1060	19	AAV16102	Humicola insolens
24	286.4	27.5	1060	19	AAV15065	Humicola insolens
25	286.4	27.5	1060	21	AA553334	Endoglucanase nucl
26	284.8	27.3	807	19	AAV16104	Humicola insolens
27	283.4	27.2	1164	21	AAA62730	Endoglucanase nucl
28	283.4	27.2	1164	24	AA143248	Rhizopus arrhizus
29	281.6	27.0	1060	13	AAQ30072	43kD endoglucanase
30	280	26.8	1060	13	AAQ31181	H. insolens cellul
31	274.8	26.3	927	17	AAT39062	Chimeric endogluc
32	273.4	26.2	894	17	AAT39061	Chimeric endogluc
33	273.4	26.2	960	17	AAT39047	CDNA encoding cell
34	271.8	26.1	922	19	AAV15072	Hybrid DNA compris
35	268.2	25.7	925	19	AAV15076	Hybrid DNA compris
36	262.2	25.1	672	24	AA143263	Humicola insolens
37	262.2	25.1	672	24	AA169425	Humicola insolens
38	260.2	24.9	1174	17	AAT39050	CDNA encoding cell
39	260.2	24.9	1174	19	AAV39096	Monocomponent endo
40	257.4	24.7	922	19	AAV15073	Hybrid DNA compris
41	247.8	23.8	1261	19	AAV23748	Humicola grisea ce
42	246.2	23.6	1132	17	AAT39053	CDNA encoding cell
43	240.2	23.0	513	17	AAT39051	CDNA encoding cell
44	237.8	22.8	885	17	AAT39075	Chimeric endogluc
45	235.4	22.6	1473	12	AAQ14857	Fusarium oxysporum

ALIGNMENTS

RESULT 1
AAA62732
ID AAA62732 standard; DNA; 1043 BP.
XX
AC AAA62732;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 7.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; .99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
DR WPI; 2000-365117/31.
XX
PT Endoglucanases of fungal origin with high activity under alkaline
PT conditions for production of paper pulp and animal feedstuffs -

Claim 44; Page 132-134; 180pp; Japanese.

This sequence encodes an endoglucanase protein. The invention relates to an endoglucanase of fungal origin which can completely break down purified cellulose at a concentration of less than 1mg protein/litre, and produces more than 50% breakdown of cellulose at pH 8.5. The invention includes endoglucanase protein sequences (see AB09825-B09830), endoglucanase nucleotide sequences (see AA62726-A62732) and primers (AA62733-A62802) which are used in the identification of the endoglucanase sequences, and in the construction of vectors containing the polynucleotides. The endoglucanase enzymes are used for the production of pulp for papermaking and for the production of animal foodstuffs.

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X      Sequence 1043 BP; 212 A; 370 C; 291 G; 170 T; 0 other;
Query Match      100.0%; Score 1043; DB 21; Length 1043;
Best Local Similarity 100.0%; Pred. No. 5e-199;
Matches 1043: Conservative      0; Mismatches 0; Indels 0; Gaps 0;

```

Qy	1	GGATCTCGGGA	CAAGATGAAGTT	CATCACTATCGCTCTCTCGGCCCTCTCTTGGCCCTCGCC	60
Db	1	GGATCTCTGGGA	CAAGATGAAGTT	CATCACTATCGCTCTCTCGGCCCTCTCTTGGCCCTCGCC	60
Qy	61	CTTCGCACTGAGAT	TGGCCTCTCGCGCTGAGTGCTCCAAGCTCTACGGACAGTGGCGCGGA	120	
Db	61	CTTGGCACTGAGAT	TGGCCTCTCGCGCTGAGTGCTCCAAGCTCTACGGACAGTGGCGCGGA	120	
Qy	121	AAGAACTGGAAC	CGGCCACCTGTCTCGAGAGCGGCTCGA	CTGCAAGGTCTCGAATGAC	180
Db	121	AAGAACTGGAAC	CGGCCACCTGTCTCGAGAGCGGCTCGA	CTGCAAGGTCTCGAATGAC	180
Qy	181	TACTACAGC	AGTGGCTCGAGCGGCTCTCTCGGGAACAAGT	CGAGCGAGTTCGCCCCAC	240
Db	181	TACTACAGC	AGTGGCTCTCGGAGCGGCTCTCTCGGGAACAAGT	CGAGCGAGTTCGCCCCAC	240
Qy	241	AAGAAGAC	CACGACCGCTGCCACAAGAAGACCA	CGACCGCGCTCACAAGAAGACTACG	300
Db	241	AAGAAGAC	CACGACCGCTGCCACAAGAAGACCA	CGACCGCGCTCACAAGAAGACTACG	300
Qy	301	ACCGCTCCCGCC	AAGAAGACCA	CGACCGTTCGACTTCGCTCMACTCGAGC	360
Db	301	ACCGCTCCCGCC	AAGAAGACCA	CGACCGTTCGACTTCGCTCMACTCGAGC	360
Qy	361	AGCTCGTCTT	CGGGAAGTACAGCGCTCTCAGCGTGGCGCTAGCGGCAACGGCGTCACT	420	
Db	361	AGCTCGTCTT	CGGGAAGTACAGCGCTCTCAGCGTGGCGCTAGCGGCAACGGCGTCACT	420	
Qy	421	ACCGCTACTGGGA	CTGTGCAAGGCTTCGTCTCGTGGCCCGGCAAGGCTTAACGTCAAG	480	
Db	421	ACCGCTACTGGGA	CTGTGCAAGGCTTCGTCTCGTGGCCCGGCAAGGCTTAACGTCAAG	480	
Qy	481	TGCGCTGTCAAGT	CTCTGCAACAAAGGACGGCGTCA	CGGCTTTAGCGACTTCCAACGCCAC	540
Db	481	TGCGCTGTCAAGT	CTCTGCAACAAAGGACGGCGTCA	CGGCTTTAGCGACTTCCAACGCCAC	540
Qy	541	TCCGGCTGCAAC	CGGGGCAACCTCTATATGTGCAACAGCA	CAACAGGCCATGGGCTGTCAAC	600
Db	541	TCCGGCTGCAAC	CGGGGCAACCTCTATATGTGCAACAGCA	CAACAGGCCATGGGCTGTCAAC	600
Qy	601	GACAACTTGC	TTACGGTTTCGGTCCGCTGCGCTT	AGCGGGGCTGGCGAGAGCCGCTGG	660
Db	601	GACAACTTGC	TTACGGTTTCGGTCCGCTGCGCTT	AGCGGGGCTGGCGAGAGCCGCTGG	660
Qy	661	TGCTGCTCTGCT	TCGAGCTCACTTTACCTCCAC	CAGCGTTGCTGGCAAGAAGATGGTC	720
Db	661	TGCTGCTCTGCT	TCGAGCTCACTTTACCTCCAC	CAGCGTTGCTGGCAAGAAGATGGTC	720
Qy	721	GTCCAGGTCA	CCAACTGGCGGTGACCTTGGCAGCT	TCGACCGGTGCCACTTCGATCTTC	780
Db	721	GTCCAGGTCA	CCAACTGGCGGTGACCTTGGCAGCT	TCGACCGGTGCCACTTCGATCTTC	780

Qy	781	CAGATCCCGGCGGCGCTCGGCATCTTCAACGGATGCTCGTCCAGTGGGCGCTCCC	840
Db	781	CAGATCCCGGCGGCGGCGCTCGGCATCTTCAACGGATGCTCGTCCAGTGGGCGCTCCC	840
Qy	841	AACGACGGTGGGGCTCGGGCTACGGCGGCATCAGCTCCGCCAGCGACTGCTCGTCCCTC	900
Db	841	AACGACGGTGGGGCTCGGGCTACGGCGGCATCAGCTCCGCCAGCGACTGCTCGTCCCTC	900
Qy	901	CCGAGCGCCCTCAGCGCGGCTCGCAAGTGGCGTTCAACTGGTTCAAGACGCCGACAAC	960
Db	901	CCGAGCGCCCTCAGCGCGGCTCGCAAGTGGCGTTCAACTGGTTCAAGACGCCGACAAC	960
Qy	961	CGGTGCATGACCTACAAGGAGGTCACTGCCCCAAAGGAGATCACCGCTAAGACCGGATGC	1020
Db	961	CGGTGCATGACCTACAAGGAGGTCACTGCCCCAAAGGAGATCACCGCTAAGACCGGATGC	1020
Qy	1021	TCGCGCAAGTAAACGCGAGATCC	1043
Db	1021	TCGCGCAAGTAAACGCGAGATCC	1043

RESULT 2
AAL43250
ID AAL43250 standard. DNA. 1043 BP.

AAL43250;

22-ATC-2002 (first entry)

Colloquium on the History of the

1

fibre processing; waste pa

Rhizopus arrhizus.

Synthetic.

WO200242474-A1.

30-MAY-2002.

21-NOV-2001; 2001WO-JP1018

21-NOV-2000: 2000.TP-035429

[illegible]

SECRET

WPI; 2002-4/1/29/50.
P-PSDB: AA015052

1. The first step is to identify the problem or question that needs to be addressed. This involves understanding the context and the specific requirements of the task.

with effect of endoglucanase

British

Example 10; Page 84-86; 10

The invention comprises the

binding domain. The zygomy-

originated endoglucanase e

processing fibres, de-lux paper pulp - which is part

The present DNA sequence

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1

	Very poor	Poor	Fair	Good	Excellent
Best Local Similarity	100.0	98.6	97.2	95.8	94.4

atches 1043; Conservative

```
QY 1 GGATCTCTGGGCAAGATGAAGTTTCATCATCTATCGCTCTCTCGCCCTCTCTTGCCCTCGCC 60
DB 1 GGATCTCTGGGCAAGATGAAGTTTCATCATCTATCGCTCTCTCGCCCTCTCTTGCCCTCGCC 60
QY 61 CTTGGCACTAGATGAGCTCTCGCGCTGAGTGTCTCAAGCTCTACGACAGTGCAGCGGA 120
DB 61 CTTGGCACTAGATGAGCTCTCGCGCTGAGTGTCTCAAGCTCTACGACAGTGCAGCGGA 120
QY 121 AAGAACTGGAACCGGCCCCACCTGCTCGAGAGCGGCTCGACCTGCAAGTCTCGAATGAC 180
DB 121 AAGAACTGGAACCGGCCCCACCTGCTCGAGAGCGGCTCGACCTGCAAGTCTCGAATGAC 180
QY 181 TACTACAGCAGTGCCTGCGAGCGCTCTCTCGGAAACAAGTCGAGCGAGTGCAGCGCCAC 240
DB 181 TACTACAGCAGTGCCTGCGAGCGCTCTCTCGGAAACAAGTCGAGCGAGTGCAGCGCCAC 240
QY 241 AAGAAGACCAACGCTGCTGCCAACAAGAACACACGACCGCGCTCACAAGAAAGACTAGC 300
DB 241 AAGAAGACCAACGCTGCTGCCAACAAGAACACACGACCGCGCTCACAAGAAAGACTAGC 300
QY 301 ACCGCTCCGCGCAAGAACACGAGCGCTGCGCAAGGCTTCGACTCGTCCAACTCGAGC 360
DB 301 ACCGCTCCGCGCAAGAACACGAGCGCTGCGCAAGGCTTCGACTCGTCCAACTCGAGC 360
QY 361 AGCTCGCTCTTTCGGGAAAGTACAGCGCTGTGAGCGGTGGCGCTAGCGGCAACGCGTCACT 420
DB 361 AGCTCGCTCTTTCGGGAAAGTACAGCGCTGTGAGCGGTGGCGCTAGCGGCAACGCGTCACT 420
QY 421 ACCGCTACTGAGCTGCTGCAAGGCTTGTGCTGCTGCGCCCGGCAAGGCTAACGTCAGC 480
DB 421 ACCGCTACTGAGCTGCTGCAAGGCTTGTGCTGCTGCGCCCGGCAAGGCTAACGTCAGC 480
QY 481 TCGCTGTCAAGTCTTCAACAGAGGAGCGGTTCACCGCTCTTAGCGACTCCACGCGCCAG 540
DB 481 TCGCTGTCAAGTCTTCAACAGAGGAGCGGTTCACCGCTCTTAGCGACTCCACGCGCCAG 540
QY 541 TCGCGGTGCAACCGCGGCAACTCTTACATGTGCAACGACCAACGACGATGGGTGTCAAC 600
DB 541 TCGCGGTGCAACCGCGGCAACTCTTACATGTGCAACGACCAACGACGATGGGTGTCAAC 600
QY 601 GACAACTTGTCTTACGCTTTCGCTGCGCTGCTGCTGCTGCGCGGCGGCGGAGAGCGCTG 660
DB 601 GACAACTTGTCTTACGCTTTCGCTGCGCTGCTGCTGCTGCGCGGCGGCGGAGAGCGCTG 660
QY 661 TGTGTCTCTGCTTTCAGCTCCTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 720
DB 661 TGTGTCTCTGCTTTCAGCTCCTTCACTTCACTTCACTTCACTTCACTTCACTTCACTT 720
QY 721 GTCCAGGTCAACCAACTGCGGTGACCTTGGCGAGCTCGACCGGTGCGCCACTTTCGATCTC 780
DB 721 GTCCAGGTCAACCAACTGCGGTGACCTTGGCGAGCTCGACCGGTGCGCCACTTTCGATCTC 780
QY 781 CAGATCGCGCGCGCGCTGCGCATCTTCAACCGATGCTGCTGCTGCGCGCGCTGCTGCT 840
DB 781 CAGATCGCGCGCGCGCTGCGCATCTTCAACCGATGCTGCTGCTGCGCGCGCTGCTGCT 840
QY 841 AAGCAAGGCTGCGGCTGCGCTGCGCGCATCAGTCTGCGCGAGCGACTGCTGCTGCTGCT 900
DB 841 AAGCAAGGCTGCGGCTGCGCTGCGCGCATCAGTCTGCGCGAGCGACTGCTGCTGCTGCT 900
QY 901 CCCAGGCGCTTCAAGCGCGGCTGCAAGTGGCGCTTCAACTGGTTCAAGAACGCGGCAAC 960
DB 901 CCCAGGCGCTTCAAGCGCGGCTGCAAGTGGCGCTTCAACTGGTTCAAGAACGCGGCAAC 960
QY 961 CCGTCCATGACCTTCAAGGAGGTGACCTGCGCCCAAGAGATCAACGCTAAGACCGGATGC 1020
DB 961 CCGTCCATGACCTTCAAGGAGGTGACCTGCGCCCAAGAGATCAACGCTAAGACCGGATGC 1020
QY 1021 TCGCGCAAGTAAACGAGGATCC 1043
DB 1021 TCGCGCAAGTAAACGAGGATCC 1043
```

```
RESULT 3
AAA62726
ID AAA62726 standard; DNA; 1017 BP.
XX
AC AAA62726;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 1.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 99JP-0302387.
XX
PA (MEIJ ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
WPI; 2000-365117/31.
P-PSDB; AAB09821.
XX
DR Endoglucanases of fungal origin with high activity under alkaline
conditions for production of paper pulp and animal feedstuffs -
XX
Claim 44; Page 104-105; 180pp; Japanese.
XX
This sequence encodes an endoglucanase protein. The invention relates
to an endoglucanase of fungal origin which can completely break down
purified cellulose at a concentration of less than 1mg protein/litre,
and produces more than 50% breakdown of cellulose at pH 8.5. The
invention includes endoglucanase protein sequences (see
AAB09825-B09830), endoglucanase nucleotide sequences (see
AAA62726-A62732) and primers (AAA62733-A62802) which are used in the
identification of the endoglucanase sequences, and in the construction of
vectors containing the polynucleotides. The endoglucanase enzymes are
used for the production of pulp for papermaking and for the production of
animal foodstuffs.
XX
SQ Sequence 1017 BP; 240 A; 250 C; 235 G; 292 T; 0 other;
Query Match 57.0%; Score 594.6; DB 21; Length 1017;
Best Local Similarity 74.0%; Pred. No. 1.3e-109;
Matches 753; Conservative 0; Mismatches 264; Indels 0; Gaps 0;
QY 16 ATGAAGTTTCATCATCTATCGCTCTCGCGCTCTTGGCTCGCCCTGCGCACTGAGATG 75
DB 1 ATGAAGTTTATTACTATTGCTTCTTCCGCTCTTGGCTCTCGCCCTCGCTACTGAATG 60
QY 76 GCCTCGCGCTGAGTGTCTCAAGCTCTACGACAGTGCAGCGGAAAGAACTGGAACGGC 135
DB 61 GCCTCTGCTGCTGAATGTAGCAAAATTGTATGTTCAATGTGTTGTTGAAGAACTGGAATGGC 120
QY 136 CCCACTGCTGCGAGCGGCTCGACCTCGAGGCTTCGAATGACTTACTACGCCAGTGC 195
DB 121 CCTACTGTTGTGAATCTCGATCCACCTGTAAAGCAACGATTTACTTCTCAATGT 180
QY 196 CTGCGGAGCGGCTCTCGGGAACCAAGTCGAGCGAGTCGCGCCACAAAGAACGACGACC 255
DB 181 CTTCCCTCTGGAAGCGAGTGGCAATAATCTTCTGAAGTGTCTCAAGAAAGACTACCACT 240
QY 256 GTTGGCCCAAGAAGACCAACGCGCGCTCAAGAAGAGACTACGACCGCTCCGCGCAAG 315
DB 256 GTTGGCCCAAGAAGACCAACGCGCGCTCAAGAAGAGACTACGACCGCTCCGCGCAAG 315
```


Wed Jun 18 17:55:18 2003

802 AACACTGGTGGTATCTTGGCTCCTCTACTGGTGCTCACTTTTGACTTGCAGTAATGCCGGT 851

793 GGCGCGCTGGCATCTTCAACGGATGCTCGTCCAGTGGGCGCTCCCAACGACGCTGG 852

862 GGTGGTGGTGGTATTTTCAATGGTTGCTCCCAAGCAATGGGTGCTCCCAATGACGGTTG 921

853 GGCTCGGCTACGGCGGCATCAGCTCGCGCAGGACTGCTCGTCCCTCCCGGCGCCTC 912

922 GGCTCGAGATACGGTGGTATTTCTTCTGCACTGACTGCTTCTAGTCTTCTTCCGCACTC 981

913 CAGCGCGCTGCAAGTGGCGCTTCAACTGGTTCAAGAAACGCCGACACACCGTCCATGACC 972

982 CAGCTGGTTGTAATGAGATTCACTGGTTCAAGAAACGCTGATAACCCCAAGCATGACT 1041

973 TACAAGAGGCTACCTGCCCCAAGGAGATCACCGCTAAGACCGGATGCTCGCGCAAGTAA 1032

1042 TACAAGGAAGTTAGCTGTCTCCCAAGGAATCACCGCAAGACAGGTTGTTCAAGAAATAA 1101

RESULT 7
AAA62728
ID AAA62728 standard; DNA; 1083 BP.
XX
AC AAA62728;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 3.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
WPI: 2000-365117/31.
P-PSDB; AAB09823.
XX
XX Endoglucanases of fungal origin with high activity under alkaline
XX conditions for production of paper pulp and animal feedstuffs -
XX
XX Claim 44; Page 113-115; 180pp; Japanese.
XX
XX This sequence encodes an endoglucanase protein. The invention relates
XX to an endoglucanase of fungal origin which can completely break down
XX purified cellulose at a concentration of less than 1mg protein/litre,
XX and produces more than 50% breakdown of cellulose at pH 8.5. The
XX invention includes endoglucanase protein sequences (see
XX AAB09825-B09830), endoglucanase nucleotide sequences (see
XX AAB62726-A62732) and primers (AAB62733-A62802) which are used in the
XX identification of the endoglucanase sequences, and in the construction of
XX vectors containing the polynucleotides. The endoglucanase enzymes are
XX used for the production of pulp for papermaking and for the production of
XX animal foodstuffs.
XX
XX Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;
XX
XX Query Match 34.7%; Score 362.4; DB 21; Length 1083;
XX Best Local Similarity 62.9%; Pred. No. 2.5e-63;
XX Matches 683; Conservative 0; Mismatches 331; Indels 72; Gaps 5

802 AACACTGGTGGTATCTTGGCTCCTCTACTGGTGCTCACTTTTGACTTGCAGTAATGCCGGT 851

793 GGCGCGCTGGCATCTTCAACGGATGCTCGTCCAGTGGGCGCTCCCAACGACGCTGG 852

862 GGTGGTGGTGGTATTTTCAATGGTTGCTCCCAAGCAATGGGTGCTCCCAATGACGGTTG 921

853 GGCTCGGCTACGGCGGCATCAGCTCGCGCAGGACTGCTCGTCCCTCCCGGCGCCTC 912

922 GGCTCGAGATACGGTGGTATTTCTTCTGCACTGACTGCTTCTAGTCTTCTTCCGCACTC 981

913 CAGCGCGCTGCAAGTGGCGCTTCAACTGGTTCAAGAAACGCCGACACACCGTCCATGACC 972

982 CAGCTGGTTGTAATGAGATTCACTGGTTCAAGAAACGCTGATAACCCCAAGCATGACT 1041

973 TACAAGAGGCTACCTGCCCCAAGGAGATCACCGCTAAGACCGGATGCTCGCGCAAGTAA 1032

1042 TACAAGGAAGTTAGCTGTCTCCCAAGGAATCACCGCAAGACAGGTTGTTCAAGAAATAA 1101

RESULT 7
AAA62728
ID AAA62728 standard; DNA; 1083 BP.
XX
AC AAA62728;
XX
DT 25-SEP-2000 (first entry)
XX
DE Endoglucanase nucleotide sequence 3.
XX
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KW animal foodstuff; ss.
XX
OS Rhizopus oryzae.
XX
PN WO200024879-A1.
XX
PD 04-MAY-2000.
XX
PF 25-OCT-1999; 99WO-JP05884.
XX
PR 23-OCT-1998; 98JP-0302387.
XX
PA (MEIJ) MEIJI SEIKA KAISHA LTD.
XX
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;
PI Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;
XX
WPI: 2000-365117/31.
P-PSDB; AAB09823.
XX
XX Endoglucanases of fungal origin with high activity under alkaline
XX conditions for production of paper pulp and animal feedstuffs -
XX
XX Claim 44; Page 113-115; 180pp; Japanese.
XX
XX This sequence encodes an endoglucanase protein. The invention relates
XX to an endoglucanase of fungal origin which can completely break down
XX purified cellulose at a concentration of less than 1mg protein/litre,
XX and produces more than 50% breakdown of cellulose at pH 8.5. The
XX invention includes endoglucanase protein sequences (see
XX AAB09825-B09830), endoglucanase nucleotide sequences (see
XX AAB62726-A62732) and primers (AAB62733-A62802) which are used in the
XX identification of the endoglucanase sequences, and in the construction of
XX vectors containing the polynucleotides. The endoglucanase enzymes are
XX used for the production of pulp for papermaking and for the production of
XX animal foodstuffs.
XX
XX Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;
XX
XX Query Match 34.7%; Score 362.4; DB 21; Length 1083;
XX Best Local Similarity 62.9%; Pred. No. 2.5e-63;
XX Matches 683; Conservative 0; Mismatches 331; Indels 72; Gaps 5

with effect of endoglucanase activity enhanced in processing fibers;
deinking waste paper and improving freeness of paper pulp' -
Disclosure: Page 70-73; 109pp; Japanese.

The invention comprises the amino acid and coding sequences of zymocetase-originated endoglucanase enzymes lacking the cellulose binding domain. The zymocetase-originated endoglucanase enzymes of the invention have enhanced endoglucanase activity. The zymocetase-originated endoglucanase enzymes of the invention are useful for processing fibres, de-inking waste paper and improving the freeness of paper pulp - which is particularly applicable in detergent compositions. The present invention represents an endoglucanase-related gene sequence of the invention.

Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;

Query Match 27.7%; Score 288.4; DB 24; Length 1017;
Best Local Similarity 58.7%; Pred. NO. 1.4e-48;
Matches 606; Conservative 0; Mismatches 396; Indels 30;

16	ATGAAGTTTCATCACTATCGCTCTCTCCGCCCTCTTGGCCCTCGCCCTTGGCACTCGATG	75
1	ATGAAGTTTCAACCGTTGCTATTACTTTCATCTGCTGTCACCTCTCAGCTCT--TCT	57
76	GCCTCGCGCGTGTAGTGTCTCCAGGCTCTACGACAGTGC CGCGAAGAACTCGAAGCGC	135
58	GCTGAAGCTGCTTTTGCAGTCTGTCTATGGTCAATGTGTGGCATTTGGATGGATGGA	117
136	CCCACCTGCTGCGAGAGCGGCTCGACCTGCA-----AGGTCGCAATGACTACTACAGC	189
118	CCTACCTGTTGTGAAGTGGCTCTACTTTGCGTTGCTCAAGAAGCAACAATACTACTCT	177
190	CAGTGTCTGCGAGCGGCTCTCGGGAAACAAGTCTGAGCGAGTGGCCCAACAAGAACC	249
178	CAATGTCTTCCGGATCCACAGTAACAATGCTGGTAACGCTAGCAGCACCAAGAAGACA	237
250	ACGACC-----GCTGCCACAAGAAGACACGACCGCGCTCTACAAGAAGACTACG	300
238	TCTACCAAGACATCTACTATCACCGCCAAGGCTACTGCTACTGTCAACCACAAGACGTA	297
301	ACCGTCTCCGCCAAGAAGACCAACGACCGTCCCAAGGCTTCGACTCCGTCACACTCGACG	360
298	ACCAAGACAACTACCAAGACAACTACCAAGACTAGCACTACTGCCGTGCTTCTACTTCC	357
361	AGCTCGTCTTCGGGAAAGTACAGCGCTGTACGCGTGTGCGGTAGCGGCAACGGCGTCACT	420
358	ACCTCTTCTTCTGCTGGTTTACAAGGTCACTCTCGCGGTAAATCTGSCAGTGGTTCCACA	417
421	ACCGCTACTCGGACTGCTGCAAGGCTTCGTGCTCTGTGGCCCGCAAGGCTAACGTCAGC	480
418	ACTCGTTATTGGGATTGTTGTAAGCTTCTTTGCAGCTGGCTTGGAAAGCTTCTGTCACT	477
481	TGCGCTGTCAAGTCTCTGCAACAAGAGACGGCGTCAACCGCTCTTAGCGACTCTCAACG	540
478	GGTCTGTTGACACCTGTGCGCTCCAAATGG---TATCTCTTTATTAGATGCCAATGCTCAA	534
541	TCCGGCTGCAACGGCGGCAACTCTCTACATGTGCAACGACCAACAGCATGGGTGTCAAC	600
535	AGTGGTTGTAAACGGTGGTAATGGTTTCATGTGTAAACAACAACCAACCTTGGGCTGTCAAT	594
601	GACACCTTGTCTTACGGTTTTCGCTGCCCTGCCAATTAGCGCGGTGGCGAGACCGCTGG	660
595	GATGAGCTCGCTTACGGTTTTCGCTGCTGCCTCTATTGCTGCTCTCAACGAAGCTGTGATGG	654
661	TGCTGCTCTCTGCTTCGAGCTCACCTTCACTTCCACCAAGCGTTGTGTGCAAGAAGATGGTC	720
655	TGTTGTGGCTGTTATGAATTGACCTTCACTTCTGCGCTGCTTCTGGAAGAAGATGGTT	714
721	GTCCAGGTCAACCAACTGTGGCGGTGACCTTGGCAGCTCGACCGGTGCCCACTTCGATCTC	780
715	GTTCAAGTTTACCAACAACCGGTGGCGATTAGG-----CTTAACCACTTTGATTGTG	765

Qy	781	CAGATGCTCCGGCGGGCGCTCGGCATCTTCAACGGATGCTCGTCCAGTGGGGGCTCCC	840
Db	766	CAAAATGCCGGTGGTGGCGTGTGTATCTTCAATGGGTGTGCTGCTCAATGGGGCGCTCCC	825
Qy	841	AACGACGGCTGGGGCTCGCGCTACGGCGGCATCAGCTCCGCGACGCACTGCTCGTCCCTC	900
Db	826	AATGATGGCTGGGGAGCTAGATATGGTGGTGTGAGCTCTGTCTCTGACTGTGCTCTCTT	885
Qy	901	CCGAGCGCCCTCAGGCGGGCTCGAATGGCGCTTCAACTGGTTCAAGAAAGCGCGACAAC	960
Db	886	CCCTCTGCTTCCAAGCTGGTTGTAAATGGAGATTTCAACTGGTTCAAGAACTCTGTATAC	945
Qy	961	CCGTCCATGACCTACAAGGAGGTCACTCGCCCAAGGAGATCACCGCTAAGACCGGATGC	1020
Db	946	CCTACCNAGACCTTCAAGGAAGTTA CCTGTCTGTCTGAATTAAC TACTCGCTCAGGTTC	1005
Qy	1021	TCGCGCAGTAA	1032
Db	1006	GAAGAAGTAA	1017

RESULT 13

AAQ26405	
ID	AAQ26405 standard; cDNA; 1058 BP.
XX	
XX	AAQ26405;
XX	
XX	11-JAN-1993 (first entry)
DT	
XX	
XX	Humicola insolens DSM 1800 endoglucanase.
XX	
XX	Detergent; washing powder; cellulase; softening clay; C14CMC-method;
KW	flocculation; radio-labelled carboxymethylcellulase; ss.
KW	
XX	
OS	Humicola insolens DSM 1800.
XX	
XX	Key
XX	Location/Qualifiers
XX	sig_peptide
FT	10..72
FT	/*tag= a
FT	mat_peptide
FT	73..927
FT	/*tag= b
XX	
XX	EP495258-A.
PN	
XX	
XX	22-JUL-1992.
PD	
XX	
XX	06-NOV-1991; 91EP-0202880.
PF	
XX	
XX	16-JAN-1991; 91EP-0870006.
PR	
XX	06-NOV-1991; 91EP-0202880.
PR	
XX	06-NOV-1991; 91EP-0202879.
XX	
XX	(PROC) PROCTER & GAMBLE CO.
PA	
XX	
XX	Baech AC, Busch A, Convents AC;
PI	
XX	
XX	WPI; 1992-243163/30.
DR	
DR	P-PSDB; AAR25525.
XX	
XX	Compact, granular; detergent compens. - contain high activity
PT	cellulase and softening clay to provide synergistic effect in
PT	softening performance
PT	
XX	
XX	Claim 10; Page 27-28; 38pp; English.
PS	
XX	
XX	The endoglucanase isolated from H.insolens DSM 1800 has Mr 43,000
CC	and high cellulase activity (i.e. removes a minimum of 10% of
CC	radiolabelled carboxymethylcellulose (C14CMC)). The enzyme can be
CC	produced recombinantly using the cDNA coding sequence and used in
CC	detergent compositions along with a surface active agent, a builder
CC	system and a softening clay. See also AAQ26407.
XX	
XX	Sequence 1058 BP; 189 A; 376 C; 288 G; 205 T; 0 other;
XX	

XX	PF	08-MAY-1991;	91WO-DK00123.
XX	PR	22-APR-1991;	91DK-0000736.
XX	PR	09-MAY-1990;	90DK-0001159.
XX	PA	(NOVO) NOVO NORDISK A/S.	
XX	XX	Rasmussen G, Mikkelsen JM, Schulein M, Packar SA, Hagen F;	
PI	PI	Hjort CM, Hastrup S;	
XX	XX	WPI; 1991-353765/48.	
DR	XX	P-PSDB; AAR15271.	
XX	DR	Cellulase prepn. comprising endoglucanase enzyme - used in	
PT	PT	detergents for cellulose-contg. fabrics or to improve drainage of	
PT	PT	paper pulp	
XX	XX	Claim 11; Page 48; 67pp; English.	
XX	CC	The cellulase (i.e. endoglucanase) gene was isolated from a H.	
CC	CC	insolens cDNA library by screening with a probe based on the amino	
CC	CC	acid sequence of the purified enzyme.	
XX	XX	Sequence 1060 BP; 190 A; 377 C; 288 G; 205 T; 0 other;	
SQ		Query Match 27.5%; Score 286.4; DB 12; Length 1060;	
		Best Local Similarity 70.7%; Pred. No. 3.5e-48;	
		Matches 461; Conservative 0; Mismatches 166; Indels 25; Gaps 5;	
QY		381 CAGCGCTGTACAGCGGTGGCGTACGGC-AACGGGCTCATTACCGCTACTCGGACTGCT	439
Db		47 CCGCCCTCCGGGTGTGGCCCTTCCCGCTGATGGCAGGTCCACCGCTACTGGACCTGCT	106
QY		440 GCAAGGCTTCGTGCTCGTGGCCCGGCAAGGCTAAGCTCAGCTCGCTGTCAAGTCTTGCA	499
Db		107 GCAAGCCTTCGTGGCGCTGGGCCAAGAGGCTCCCGTGAAACGCTGTCTTTTCTTGCA	166
QY		500 ACAAGGAGCGGTACCGCTCTTAGCGACTCAAGGCCAGTCCGGCTGCAAA---CGGCG	556
Db		167 AC---GCCAACTTCAGCGGTATACGGGATTCAGAGCCAGTCCGGCTGCGAGCGGGCG	223
QY		557 GCAACTCTTACATGTGCAACAGCAACACGATGGGTGTCAACGACAACCTTGCTTACG	616
Db		224 GTGTGGCTACTCGTGGCCGACAGACCCCATGGCTGTGAACGACACTTCGCGCTCG	283
QY		617 GTTTCGCTCGCGTGCATATAGCGCGGTGGCGAGAGCGCTGGTGTCTCTCTGCTTTCG	676
Db		284 GTTTTGTCTGCCACCTCTATTGGCGGCAGCAATGAGCGGGCTGTGTCTTGGCGTGTCTACG	343
QY		677 AGCTCACCTTACCTCCACACGCTGTGTGGCAAGAAGATGGTCTCAGGTCAACCA	736
Db		344 AGCTCACCTTACATCCGCTCTGTGTGGCAAGAAGATGGTCTCAGTCCACCA	403
QY		737 CTGGCGGTGACCTTGGCAGTCTCGA CCGTGGCCACTTCAGATCTCCAGATGCCCGCGCGG	796
Db		404 CTGGCGGTGATCTTGGCAGCAA-----CCACTTCGATCTCAACATCCCGCGCGGCG	454
QY		797 GCGTGGCATCTTCAACGATGCTGCTCCAGTGGGGGCTCCCAACGACGGCTCGGGCT	856
Db		455 GCGTGGCATCTTCAACGATGCTGCTCCAGTGGGGGCTCCCAACGACGGCTCGGGCT	505
QY		857 CCGGCTACCGCGCATCTGCTCGGCGAGTGTCTGCTCCCTCCCGAGCGCTCCAGG	916
Db		506 AGCGCTACCGCGCATCTGCTCGGCGAGTGTCTGCTCCCGAGCGCTCCAGG	565
QY		917 CCGGCTGCAAGTGGCGCTTCAACTGGTTCAAGAACCGCAACACCGTCCATGACCTACA	976
Db		566 CCGGCTGCTACTGGCGCTTCAAGTGGTTCAAGAACCGCAACACCGTCCATGACCTACA	625
QY		977 AGGAGGTTCACCTGCCCCAAGGAGATCACCGCTTAAGACCCGGATGCTCGGCCAA	1028
Db		626 GTGAGGTCCAGTCCCGAGCGAGTGTGCTCGCTCGCACCGGATGCGCGCCAA	677

Query Match	27.5%	Score 286.4	DB 13	Length 1058
Best Local Similarity	70.7%	Pred. No. 3.5e-48		
Matches 461	Conservative 0	Mismatches 166	Indels 25	Gaps 5
381	CAGCGCTGTCAGCGGTGGCGCTACGCGC-AACGGCGTCACTACCGCGCTACTGGGACTGCT	439		
47	CGCGCTTGGCGGTGTTGGCGCTTGGCGCTGATGGCAGGTCCACCGCGCTACTGGGACTGCT	106		
440	GCAAGGCTTCGTGCTCGTGGCGCGGCAAGGCTAAAGCTGAGCTCGCTGCTCAAGTCTCTGCA	499		
107	GCAAGGCTTCGTGCGGTGGCGCGGCAAGGCTTCCGCTGAAACGAGCTGTCTTTCTGCA	166		
500	ACAAAGGACGGCGTCCACCGCTCTTTAGCGACTCCAAACGCCAGTCCGGCTGCA--CGCG	556		
167	AC--GCCAACTTCACGGGTATCACGGACTTCGACGCCAAGTCCGGCTCGGAGCCGGCG	223		
557	GCAACTCTACATGTGCACGACACGACGATGGGCTGTCAACGACAACTTGTCTTACG	616		
224	GTGTGCGCTTACTGTGGCGCGCACGACCCCATTTGGCTGTGAACGAGACTTCGGCTCG	283		
617	GTTCGCTGCGCGTCCACTTAGACGGCGGTGGCGAGACCGCTGGTGTCTCTCTGCTCG	676		
284	GTTCGCTGCGCGTCCACTTAGACGGCGGTGGCGAGACCGCTGGTGTCTCTCTGCTCG	343		
677	AGCTCACTTACCTTCAACGAGTGTCTCCAGTGGCGGCTTCCACGAGTCCACCA	736		
344	AGCTCACTTCAACGAGTGTCTCCAGTGGCGGCTTCCACGAGTCCACCA	403		
737	CTGGCGGTGACCTTCGGCAGCTCGACCGGTGCCACTTTCGATCTCCAGATGCCCGCGCG	796		
404	CTGGCGGTGACCTTCGGCAGCTCGACCGGTGCCACTTTCGATCTCCAGATGCCCGCGCG	454		
797	GGTTCGGCATCTTCAACGAGTGTCTCCAGTGGCGGCTTCCACGAGTCCCGCGCG	856		
455	GGTTCGGCATCTTCCAGCGATGCACTCCCGAGTTCGGCGGTCTGCC--GGCC	505		
857	CGCGCTACGGCGGATCAGCTCCGCGACGACTGTCTGTCTCCCGAGCGCGCTCCAG	916		
506	AGCGCTACGGCGGATCTCGTCCCGACGAGTGGGATCGGTTCGCGAGCGCTCAAG	565		
917	CGCGCTGCAAGTGGCGCTTCACTGGTTCAAGAACGCGGACACCGTCCATGACCTACA	976		
566	CGCGCTGCTACTGGCGCTTCGACTGGTTCAAGAACGCGGACATCCGAGCTTCAGCTTC	625		
977	AGGAGTCACTTCGCCCAAGGAGATCACGGCTTAAGACCGGATGCTTCGCGCAA	1028		
626	GTGAGTTCAGTTCGCCCGGAGTGTCTGCTGACCGGATGTCGCGCAA	677		
RESULT 14				
AAQ14856				
ID	AAQ14856 standard; DNA; 1060 BP.			
XX	AAQ14856;			
AC				
XX				
DT	18-FEB-1992 (first entry)			
XX				
DE	Humicola insolens DSM 1800 endoglucanase.			
XX				
KW	cellulase; ss.			
XX				
OS	Humicola insolens.			
XX				
PH	Key Location/Qualifiers			
FT	sig_peptide 10..72			
FT	mat_peptide 73..924			
FT	/*tag= a			
FT	/*tag= b			
XX				
PN	WO9117243-A.			
PD	14-NOV-1991.			

RESULT 15

AAQ26380
ID AAQ26380 standard; DNA; 1060 BP.

XX AC AAQ26380;

XX DT 07-JAN-1993 (first entry)

XX DE Endoglucanase #1.

XX KW CMC-endoase; 43 kD cellulase; monoclonal antibody; as.

XX OS Humicola insolens.

XX Key Location/Qualifiers

XX CDS 10..927

XX FT /*tag= a

XX FT sig_peptide 10..72

XX FT /*tag= b

XX FT mat_peptide 73..924

XX FT /*tag= c

XX EP495257-A;

XX PD 22-JUL-1992.

XX PF 06-NOV-1991; 91EP-0202879.

XX PR 16-JAN-1991; 91EP-0870006.

XX PR 06-NOV-1991; 91EP-0202880.

XX PR 06-NOV-1991; 91EP-0202879.

XX XX

XX PA (PROC) PROCTER & GAMBLE CO.

XX PI Baeck AC, Busch A, Ceulemans RAA;

XX DR WPI; 1992-243163/30.

XX DR P-PSDB; AAR26380.

XX Compact, granular detergent compsns. - contain high activity
PT cellulase and softening clay to provide synergistic effect in
PT softening performance
XX PS Disclosure; Page 20-21; 29pp; English.XX The sequences given in AAQ26380 and AAQ26382 are endoglucanases which
CC are immunoreactive with a monoclonal antibody raised against a
CC partially purified 43 kD cellulase derived from Humicola insolens.
CC These endoglucanases exhibit a CMC-endoase activity of at least
CC about 50, pref. at least about 60, in particular at least about 90 CMC-
CC endoase units per mg of total protein. These endoglucanases have
CC molecular weight of approx. 43 kD.

XX SQ Sequence 1060 BP; 190 A; 377 C; 287 G; 206 T; 0 other;

Query Match

Best Local Similarity 27.5%; Score 286.4; DB 13; Length 1060;

Matches 461; Conservative 0; Mismatches 166; Indels 25; Gaps 5;

QY 381 CAGCGCTGTACGCGGTGGCGCTAGCGGC-AACGCGCTCACTACCGCTACTGGGACTGCT 439

DB 47 CCGCCCTGCCGGTGTGGCCCTTGGCCCTGTATGGCAGGTCCACCCGCTACTGGGACTGCT 106

QY 440 GCAAGGCTTCGTGCTCGTGGCCCGCAAGGCTAACGCTCAGCTCGCCTGTCAAGTCTCTGCA 499

DB 107 GCAAGCCTTCGTGCGGTGGGCCCAAGAGGCTCCCGTGAACCAAGCTGTCTTTCTGCA 166

QY 500 ACHAGACGGCGTCAACGCTCTTAGGACTTCAACGCCCAAGTCCGGCTGCAA---CGGCG 556

DB 167 AC---GCCAACTTCCAGCGTATCAGCGACTTCAGCGCAAGTCCGGCTCGAGCGGGCG 223

QY 557 GCAACTCTTACATGTGCAACGACAAACAGCCATGGCTGTCAACGACAACTTGTCTTACG 616
 DB 224 GTGTGGCTTACTCGTGGCGCCGACAGACCCCATGGCTGTGAACGACGACTTCGGCTCG 283
 QY 617 GTTTCGCTGCCCTGCCATTTAGCGCGGTGGCGAGAGCGCTGGTGTCTCTCTGCTTCG 676
 DB 284 GTTTTGTGCGCACTCTATTGCGCGCAGCAATGAGCGGGCTGGTGTCTGCGCTGCTACG 343
 QY 677 AGCTCAGCTTCACTTCCACCAGCGTGTGGCAAGAGATGGTCTCCAGGTCAACCAACA 736
 DB 344 AGCTCAGCTTCACTTCCAGCGGTCTGTGTCGCAAGAGATGGTCTCCAGTCCACCAGCA 403
 QY 737 CTGGCGGTGACCTTGGCAGCTCGACCGGTGCCACTTTCGATCTCCAGATGCCCGGGCGG 796
 DB 404 CTGGCGGTGATCTTGGCAGCAA-----CCACTTTCGATCTCAACATCCCGGGGGCG 454
 QY 797 GCGTGGCATCTTCAACCGATCTCGTCCAGTGGGGCGCTCCCAACGACGGCTGGGGCT 856
 DB 455 GCGTGGCATCTTTCGACGGATGCACTCCCGAGTTCGGCGGTCTGCC-----GGCC 505
 QY 857 CGGCTAGCGGGCGCATCAGCTCCGCGAGGACTGTCTCGTCCCTCCCGAGGCCCTCCAGG 916
 DB 506 AGCGCTAGCGGGCGCATCTCGTCCCGCAACGAGTGGATCGGTTCGCCGACGCCCTCAAGC 565
 QY 917 CCGGCTGCAAGTGGCGCTTCAACTGGTTCAGAAAGCGCCGACAAACCGCTCCATGACCTACA 976
 DB 566 CCGGCTGCTACTTGGCGCTTCGACTGGTTCAGAAAGCGCCGACAAATCCGAGTTCAGTTC 625
 QY 977 AGGAGTCACTTGGCCCCAAGGAGATCAACGCTTAAGACCGGATGCTCGCGCAA 1028
 DB 626 GTCAGGTTCAGTGGCGCCAGCGGAGCTCGTCTCGCACCGGATGCCCGCGCAA 677

Search completed: June 18, 2003, 02:04:11

Job time : 295 secs

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